

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
FISHERIES DIVISION

**STATUS OF THE FISHERIES
IN MICHIGAN WATERS OF
LAKE ERIE AND LAKE ST. CLAIR
2004**



Michigan DNR Research Vessel Channel Cat



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Website: http://www.michigan.gov/dnr/0,1607,7-153-10364_10951_11304---,00.html

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Highlights for 2004

The purpose of this report is to provide an update on the status of the fisheries in the Great Lakes and connecting waters of southeast Michigan. Sources of information used in compiling this report include creel surveys, charter boat reports, an angler diary program, the Master Angler program, and commercial fishery records, as well as fisheries research studies. Some of the highlights described in detail include:

- Lake Erie yellow perch abundance has increased in recent years, whereas walleye abundance has been low. Walleye experienced very good reproduction in 1999 and 2003, but very poor or below average reproduction in 1998, 2000, and 2002.
- Non-charter angler catch rates for Lake Erie walleye and yellow perch declined in 2004. Angler effort increased, but remained consistent with the levels observed since 1995.
- Creel surveys estimated a combined harvest of 159,000 walleye and 827,000 yellow perch from the Michigan waters of the Detroit River, Lake St. Clair, and St. Clair River. About 193,000 legal-sized smallmouth bass were caught, but 92% of those were released.
- Charter boat catch rates for Lake Erie walleye were about four times higher than those estimated for non-charter anglers, while yellow perch charter boat catch rates were slightly lower than those estimated for non-charter anglers.
- Entries in the Master Angler Program clearly show that Lake St. Clair is the premier Michigan water for trophy muskellunge and smallmouth bass.
- The trap net survey of Lake St. Clair in 2004 documented the continued growth of the strong 1998 smallmouth bass year class beyond the minimum size limit. Older, trophy-size smallmouth bass were well represented in the trap net catch.
- Long-term walleye tagging studies on Lake Erie illustrate the important contribution of Lake Erie walleye to the Great Lakes sport fishery of Southeast Michigan, from Port Huron to Toledo.
- Tagging studies of lake sturgeon in the connecting waters since 1997 have demonstrated that lake sturgeon routinely move between Lake St. Clair and southern Lake Huron.

Fishery Forecast for 2005

Annual variation in reproductive success of walleye and yellow perch can result in substantial year to year changes in the abundance of these species. Harvestable-size yellow perch abundance will be about the same as last year in Lake Erie and Lake St. Clair, with strong contributions from the 2001, 2000, 1999, and 1998 year classes. Walleye abundance will increase in 2005, but many of the fish will be less than 15 inches in length (age 2 fish). As a result, Lake Erie and Detroit River walleye anglers may catch many sub-legal walleye, especially early in the summer. Muskie and bass numbers tend to remain more stable from year to year and both species should continue to provide excellent fishing opportunities in 2004, particularly in Lake St. Clair and the Detroit River. However, weather conditions can affect sport fishing success as much as fish abundance. Therefore it is difficult to predict fishing success. Water levels are forecasted to increase slightly this year, thus shallow waters may continue to restrict angler access to some fishing areas in the connecting waters.

Sport Fishery Summary

An on-site creel survey conducted by the Michigan Department of Natural Resources (MDNR) produced a total harvest estimate of 430,439 fish (Table 1) for Michigan's 2004 Lake Erie sport fishery (non-charter). In combination, walleye and yellow perch accounted for 93% of the total harvest, illustrating their importance in the sport fishery. Estimated angler effort in 2004 increased, but remained consistent with levels observed since 1992 (Figure 1). Catch rates for both walleye and yellow perch declined in 2004 (Figure 2). Trends in angler effort and catch rates for walleye and yellow perch since the mid-1980's suggest that the level of angler effort on Lake Erie is affected by many factors in addition to catch rates. Other factors, including weather, prey fish abundance, fishing success on other Great Lakes waters, and regional economic conditions have likely contributed to the comparatively low level of fishing effort since 1991.

Biological data were collected from walleye and yellow perch during the 2004 on-site creel survey. The 2001 year class (age 3) dominated the walleye harvest, comprising 41% of the catch

(Figure 3). The 1999 year class also made a substantial contribution to the fishery as age 5 fish, accounting for 33% of the harvest. Harvested age 3, 4, and 5 walleye averaged 432 mm (17.0 in.), 463 mm (18.2 in.), and 500 mm (19.7 in.) in total length. The overall average length of walleye harvested in the sport fishery in 2004 was 478 mm (18.8 in.).

Yellow perch harvest was dominated by age 3 fish (2001 year-class), which accounted for 54% of the total harvest (Figure 3). In combination, age 4 and older fish contributed an additional 44% of the total harvest. Average lengths of harvested age 3, 4, and 5 yellow perch were 209 mm (8.2 in.), 216 mm (8.5 in.), and 228 mm (9.0 in.), respectively. The observed mean length at age for yellow perch taken in the Michigan sport fishery declined slightly for all ages in 2004 (Figure 4). Reduced size at age may reflect increased abundance or exploitation. Alternatively, changes in the food web of the western basin could also be a factor.

Due to data processing constraints, creel survey results for the St. Clair River, Lake St. Clair, and Detroit River (hereafter referred to as the St. Clair-Detroit River system or SCDRS) lag behind Lake Erie by a year. In 2003, on-site creel surveys conducted by the MDNR produced a total harvest estimate of 1,100,074 fish for Michigan's waters of the SCDRS (Table 2). The primary species harvested in the Detroit River were walleye, white bass, and yellow perch. In Lake St. Clair, yellow perch, walleye and smallmouth bass were most abundant in the harvest. Walleye and yellow perch were the most common species harvested from the St. Clair River, where a few trout and salmon were also taken. Estimates of total catch (including harvest plus legal-size fish caught and released) were calculated for selected species. Only about 8% of the legal size smallmouth bass reported caught by interviewed anglers were actually harvested from the connecting waters in 2003. Similarly, about 30% of the legal size muskies reported caught were harvested. Alternatively, for walleye, anglers kept nearly 92% of all legal-sized fish they caught.

Biological data were collected from harvested walleye and smallmouth bass during the 2003 Lake St. Clair on-site creel survey. The 1999 year class (age 4) dominated the walleye harvest, comprising 47% of the catch (Figure 5). The overall average length of walleye harvested in the

Lake St. Clair sport fishery in 2003 was 457 mm (18.0 in.). For smallmouth bass, the 1998 year class (age 5) accounted for 36% of the harvest. The overall average length of smallmouth bass harvested in the Lake St. Clair sport fishery in 2003 was 406 mm (16.0 in.).

A comparison of 2003 harvest rates for the major species sought in the Great Lakes waters of southeast Michigan indicates that perch fishing success was highest in Lake Erie and Lake St. Clair (Figure 6). Walleye fishing success was best in Lake Erie and the St. Clair River. White bass fishing success was best in the Detroit River and Lake Erie.

Since 1989, Michigan charter boat operators have been required to report their charter fishing harvest and effort to the MDNR. In 2004, Michigan charter boat anglers harvested 21,439 fish from Lake Erie (Table 3). Yellow perch (53%) and walleye (46%) were the major species harvested, accounting for 99% of the catch. Catch rates for both walleye and yellow perch declined in 2004 (Figure 7). For walleye, the catch rate was the lowest recorded since the charter boat reporting program was legislated in 1989. Still, charter boat walleye catch rates were more than four times higher than those estimated for non-charter anglers in 2004, while the yellow perch charter catch rate was slightly lower than the rate for non-charter boat anglers.

For the St. Clair-Detroit River system, charter boat anglers harvested 7,680 fish (Table 4). Yellow perch (46%), walleye (30%), and "other" species (23%), made up the bulk of the catch. The "other" species category is thought to consist mainly of smallmouth bass. Charter boat catch rates for walleye were the highest recorded since 1990, while yellow perch catch rates declined for a second consecutive year (Figure 8). Over the last 10 years, the walleye charter catch rate for Lake Erie has been about 3 to 4 times higher than the St. Clair-Detroit River system rate. This difference may be a reflection of much lower walleye densities in Lake St. Clair throughout this time period. The decline of the Thames River walleye population would likely be a contributing factor to lower walleye abundance in St. Clair-Detroit River system since 1990.

The number of reported charter excursions on Lake Erie declined greatly in 2004 (Figure 9). Although some of this decline may be attributed to the walleye season closure in April and May,

much of the decline resulted from lower numbers of excursions reported in June, July, and August. This could reflect a shift by the Michigan charter boat fleet to fishing grounds in Ohio waters of Lake Erie. Michigan charter boat operators are not required to report their fishing in Ohio waters to the Michigan reporting program. Charter boat excursions on the St. Clair-Detroit River system declined slightly in 2004.

Muskellunge catch rates derived from the Angler Diary Program on Lake St. Clair indicate that catch rates improved through the late 1980's and early 1990's and have remained fairly steady over the past 10 years (Figure 10). We believe the quality of the Lake St. Clair muskellunge fishery is also reflected in the MDNR's Master Angler Program. The total number of muskellunge from Lake St. Clair entered for Master Angler Awards in 2004 exceeded 50 fish for the eight consecutive year (Figure 11). The number of fish over 30 pounds remained above the numbers recorded prior to 1992. We believe that factors contributing to the consistent high quality of this fishery include: 1) a positive response to increased minimum size limits on both sides of the lake since the mid-1980's; 2) physical and biological changes in the lake such as clearer water and increased aquatic plant growth resulting in improved habitat for muskellunge; and, 3) increased voluntary catch and release fishing for muskies in Lake St. Clair by both sport and charter anglers. It is noteworthy that there has been no apparent decline in the quality of the muskie fishery since the presence of muskie pox was documented in the lake's muskie population in 2002.

Statistics from the Master Angler program also indicate that Lake St. Clair is the premier waterbody in the state for trophy smallmouth bass. Lake St. Clair accounted for 12% of all smallmouth bass entries in 2004 (catch/keep and catch/release programs combined). Since the early 1990's, both catch/keep and catch/release Master Angler smallmouth bass entries from Lake St. Clair have exhibited an increasing trend (Figure 12). Catch/release entries have outnumbered catch/keep entries for the last five years. The strong representation of Lake St. Clair smallmouth bass in the statewide Master Angler Program is likely a reflection of an abundance of trophy-size smallmouth bass in the lake, a high degree of angler effort targeting the species, and a strong catch-and-release ethic among smallmouth bass anglers.

Commercial Fishery Summary

In 2004, two Michigan commercial fishing licenses were active on Lake Erie. The state licensed commercial seine operations in the shallow embayments along Michigan's Lake Erie shoreline harvested 8 species of fish for a total of 149,356 pounds (Table 5). In combination, common carp (63%), buffalo (13%) and channel catfish (16%) accounted for 92% of the total harvest by weight. The total value of the 2004 Lake Erie commercial harvest from Michigan waters was estimated at \$44,093.

Summary of Netting Surveys

Since 1978, the MDNR has fished variable mesh multi-filament gill nets at two locations in western Lake Erie each fall, as part of the interagency yearling walleye assessment program. During 2004, four net lifts caught a total of 1,144 walleye. The total walleye catch-per-effort for the index sites (157.3) recovered from the record low (42.8) in 2003, to the highest level observed since 1994 (Table 6). This recovery is mainly a result of the strong contribution from the 2003 year class as yearlings (81.3), which accounted for more than 50% of the catch. In contrast, the low age specific catch rates for the 2000 and 2002 year classes illustrate the poor spawning success for Lake Erie walleye in those years. The combination of a very weak 2000 year class, a below average 2001 year class, and an extraordinarily weak 2002 year class resulted in lower walleye abundance for Lake Erie walleye anglers in 2004.

The forage fish community of Lake St. Clair has been surveyed with bottom trawls each year since 1996 by the MDNR. A total of 20 trawl tows were conducted at the Anchor Bay index trawling site in 2004. The spring samples were dominated by spottail shiner and yellow perch (Table 7). The species with highest mean densities in the fall samples were mimic shiner, spottail shiner, and trout-perch. Densities of round gobies increased in both the spring and fall surveys. Yellow perch age-specific catch rates from the trawl survey indicate highly variable recruitment in Lake St. Clair (Table 8). Yellow perch recruitment in 1993, 1994, 1998, and 2003 was strong. Alternatively, recruitment was poor in 1999, 2000, and 2002.

In 2004, the MDNR surveyed the adult fish populations in Anchor Bay, Lake St. Clair with trap nets. Five trap nets were fished from May 3 to May 26. A total of 3,732 fish representing 25

species were captured during the survey. Rock bass were numerically dominant, accounting for 50% of the total (Figure 13). Other common species in the nets included smallmouth bass, freshwater drum, channel catfish, and yellow perch.

Ages were estimated for smallmouth bass and walleye based on interpretation of scale samples. Age composition for those species is presented in Figure 14. The dominant walleye year class was the 2001 year class (Age 3), accounting for 33% of the total catch. The 1998 year class (Age 6) accounted for 42% of the smallmouth bass catch. A total of 147 walleye and 267 smallmouth bass were tagged and released at the Anchor Bay trap net site in 2004.

The length frequency of smallmouth bass captured in the trap nets reflects the dominance of the 1998 year class (Figure 15). Smallmouth bass less than legal size (356 mm or 14 inches total length) made up 58% of the catch in 2002, but accounted for only 27% of the catch in 2003 and just 16% in 2004. This shift is a result of the growth of individuals of the dominant 1998 year class beyond the minimum size limit during the past two years. The mean age for 20 inch smallmouth bass (11 years) reveals the importance of older fish in the population for providing anglers with the opportunity to catch trophy size smallmouth bass.

The trap net survey revealed an abundant population of channel catfish in Anchor Bay dominated by trophy size individuals. The average weight of all channel catfish captured during the 2004 survey was 7.4 pounds. Over 35% of the channel catfish captured in the trap nets exceeded the minimum size requirement (27 inches total length) for the MDNR Master Angler program. Although anglers are discouraged from keeping large channel catfish for food due to consumption advisories, catch-and-release trophy channel catfish angling opportunities are clearly available in Anchor Bay during the spring. The high abundance of large channel catfish suggests that this population is currently experiencing low exploitation.

A total of 198 lake sturgeon were collected during assessment surveys on Lake St. Clair and the St. Clair River in 2004. Sturgeon captured averaged 46.3 inches in total length, with a range from 14 inches to 69 inches. Ages were estimated for 181 sturgeon based on pectoral fin ray sections.

Thirty-five year-classes were represented with ages ranging from 2 to 40 years. Combined age samples from 1997-2004 indicate that survival of lake sturgeon spawned in the 1970's and 1980's has been fairly consistent, but lake sturgeon spawned in the 1950's and 60's are less abundant (Figure 16). This may be a result of improved water quality after the Clean Water Act of 1972. More conservative lake sturgeon sport fishing regulations implemented in 1983 by Michigan could also be a factor in the increased survival

Fish Tagging Studies

In 2004, a total of 4,417 walleye were tagged with non-reward tags by Ontario, Ohio, New York, and Michigan at seven Lake Erie and Lake St. Clair sites. A total of 169 non-reward tags placed on fish in 2004 were recovered by fishermen for a single season reporting rate of 3.8%. The 2004 site-specific reporting rate varied from a high of 10.2% at the Anchor Bay, Lake St. Clair site, to a low of 2.1% for the Van Buren Bay site in New York. The interagency tagging study continues to provide evidence of substantial movement of walleye from spawning locations in Lake Erie through the St. Clair connecting waters (Figure 17).

Legal size walleye (147 fish) and smallmouth bass (267 fish) captured in survey trap nets in Anchor Bay during May and June, 2004 were tagged and released. A total of 15 walleye and 2 smallmouth bass tagged in 2004 were recovered by anglers and reported to MDNR. A map showing the geographical distribution of walleye tag recoveries in 2004 for walleye tagged in Anchor Bay is presented in Figure 18. On average, recaptured walleyes tagged in 2003 had traveled 14.1 km from the Anchor Bay tag site, while those tagged in 2004 had traveled 30.4 km. The tagged walleye recovered by anglers averaged slightly smaller in total length at tagging compared to the tagged population. This difference suggests that the largest individuals were either subject to slightly higher natural mortality or were less vulnerable to capture. The seasonal pattern of walleye tag recoveries differed for the two tag years. Recoveries for walleye tagged in 2004 were reported during May through October and came from the St. Clair River to western Lake Erie. In contrast, recoveries in 2004 of walleye tagged in Anchor Bay in 2003 were reported during spring and were caught equally from the St. Clair River, Lake St. Clair, and the Detroit River. This pattern of recoveries suggests a substantial

annual migration of walleye from Lake Erie northward into and through the St. Clair system during the summer and returning to Lake Erie by the following spring.

There was a large difference in the tag reporting rate between walleye (10.2%) and smallmouth bass (0.7%). Some of this difference is likely due to higher angler exploitation for walleye. The 2003 Lake St. Clair creel survey documented that only about 15,000 smallmouth bass were harvested from a total catch of over 166,000 legal size bass. This high proportion of catch-and-release fishing may have accounted for a portion of the lower tag detection and/or reporting. Alternatively, tag loss rates or natural mortality rates for smallmouth bass tagged in Lake St. Clair may be much higher than for walleye.

A total of 1,411 lake sturgeon have been tagged and released on the St. Clair River and Lake St. Clair since 1996. To date, eighty-one tagged lake sturgeon have been recaptured. Thirty-five have been recovered with survey setlines in the North Channel. One was recovered in a survey trap net in Anchor Bay. Fourteen recoveries were reported by sport anglers, nearly all from the North Channel. Twenty recoveries have been reported from the Ontario commercial trap net fishery in southern Lake Huron, approximately 70 km from the tag site. All other recaptures have occurred within 10 km of the tag sites. Although trawling has accounted for the capture of 55% of the sturgeon tagged and released during this study, only sixteen recoveries (20%) have been from a fish originally caught in a trawl on Lake St. Clair. This may be an indication that fish residing year round in the St. Clair River, or moving north into southern Lake Huron, experience a higher level of fishing exploitation.

Water Levels

After nearly 30 years of above average water levels, anglers and boaters have experienced below average water levels in the connecting waters and Lake Erie during the last six years. Water levels in the connecting waters are expected to be 2 to 4 inches higher in 2004 than last year, but will remain near the long term average. Lower water levels may prove an impediment to sport anglers by restricting boat launching and boat travel to some traditional fishing areas. The effect of lower water levels on fish populations is uncertain. Short-term impacts

may be negative. For example, northern pike spawning may be negatively impacted because coastal wetlands are dewatered. Bass spawning beds could also be more visible and more vulnerable to bass anglers. However, low water levels can result in recovery of lost coastal wetland areas. In Lake St. Clair, recovery of beds of emergent bulrush and wild rice is already apparent. Unfortunately, invasive common reed (*Phragmites australis*) has also expanded its distribution in the St. Clair Flats area during this period of low water. When water levels return to average or higher, increased coastal wetland habitat will positively impact many of the fish species in the connecting waters.

Sport Fishing Regulations

Walleye in Lake Erie are managed cooperatively with other jurisdictions under a harvest quota system. Reduced spawning success for walleye in Lake Erie resulted in lower adult walleye abundance in recent years and this trend appears likely to continue. Consequently, walleye harvest quotas have been reduced since 2001. To avoid exceeding the quota, regulations for walleye fishing in Michigan's waters of Lake Erie were changed in 2004. The daily bag limit was reduced to 5 fish, while the walleye minimum size limit was increased to 15 inches. In addition, the walleye season is closed during April and May. Collectively, these changes reduced the Michigan walleye harvest in Lake Erie sufficiently to remain within the quota in 2004. These changes will remain in effect for 2005.

The open season for smallmouth and largemouth bass fishing in the Michigan portion of the connecting waters (St. Clair River, Lake St. Clair, and Detroit River) is the third Saturday in June to December 31. It is a violation of the Natural Resources and Environmental Protection Act to fish for smallmouth bass during the closed season (Public Act 451 of 1994, Part 487, Sec. 324.48716), even if the angler intends to release any bass caught. The objective of the season closure is to protect bass during the pre-spawning and spawning periods when they are particularly vulnerable to overexploitation. Male bass guard the nest and protect the eggs and fry from predation by other fish. Removal of nest guarding males for just a minute or two has been documented to increase egg and fry predation. We urge bass anglers to show restraint and comply with the existing fishing regulations on the connecting waters.

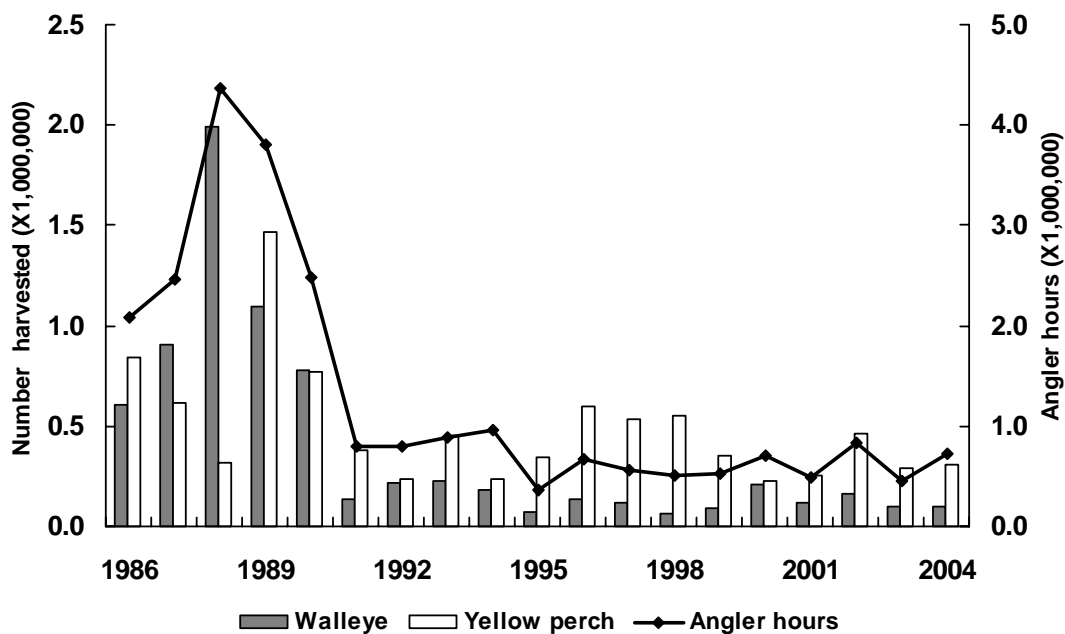


Figure 1.—Estimated harvest and effort for Michigan's Lake Erie sport fishery, 1986-2004.

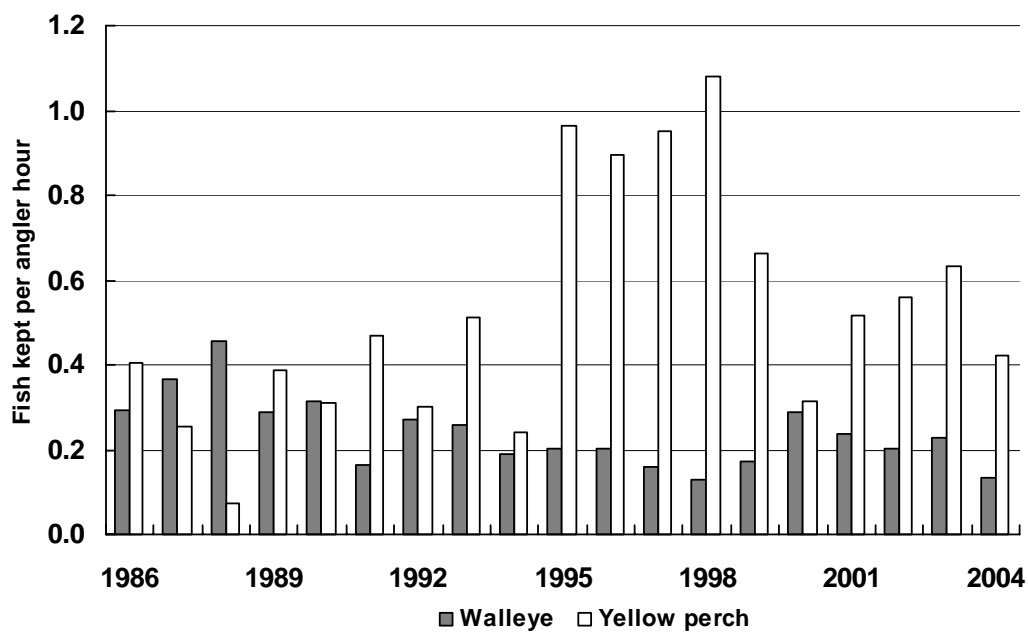


Figure 2.—Walleye and yellow perch catch rates for Michigan's Lake Erie sport fishery, 1986-2004.

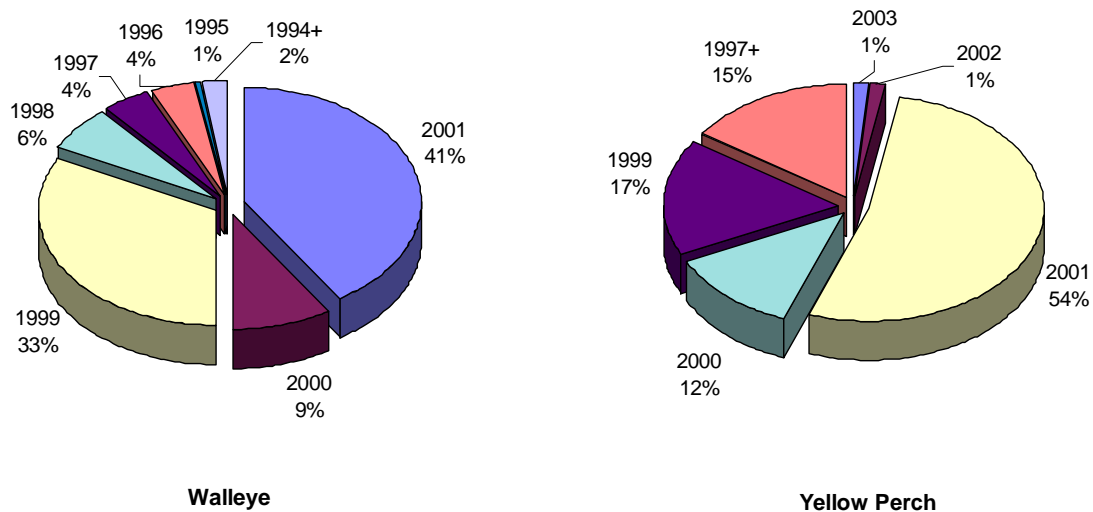


Figure 3. —Year-class contribution to Michigan sport harvest for walleye and yellow perch from Lake Erie in 2004.

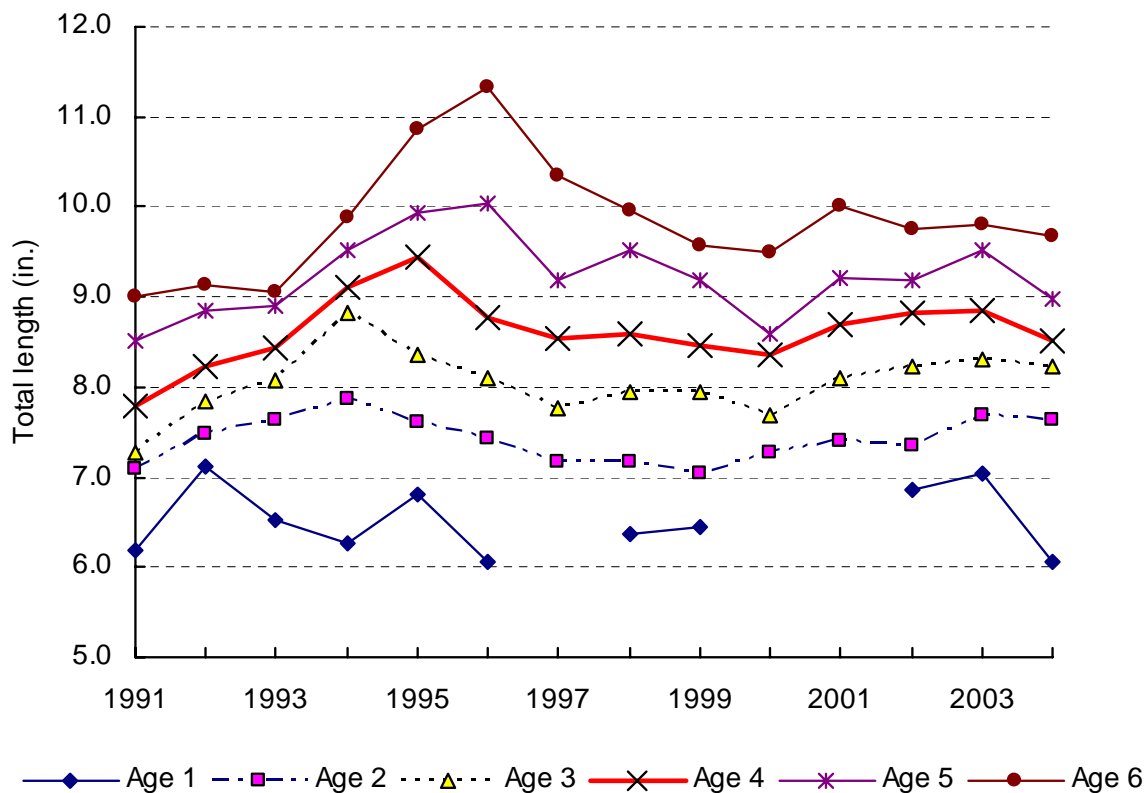


Figure 4. —Mean length at age for sport caught yellow perch from Michigan's waters of Lake Erie, 1991-2004.

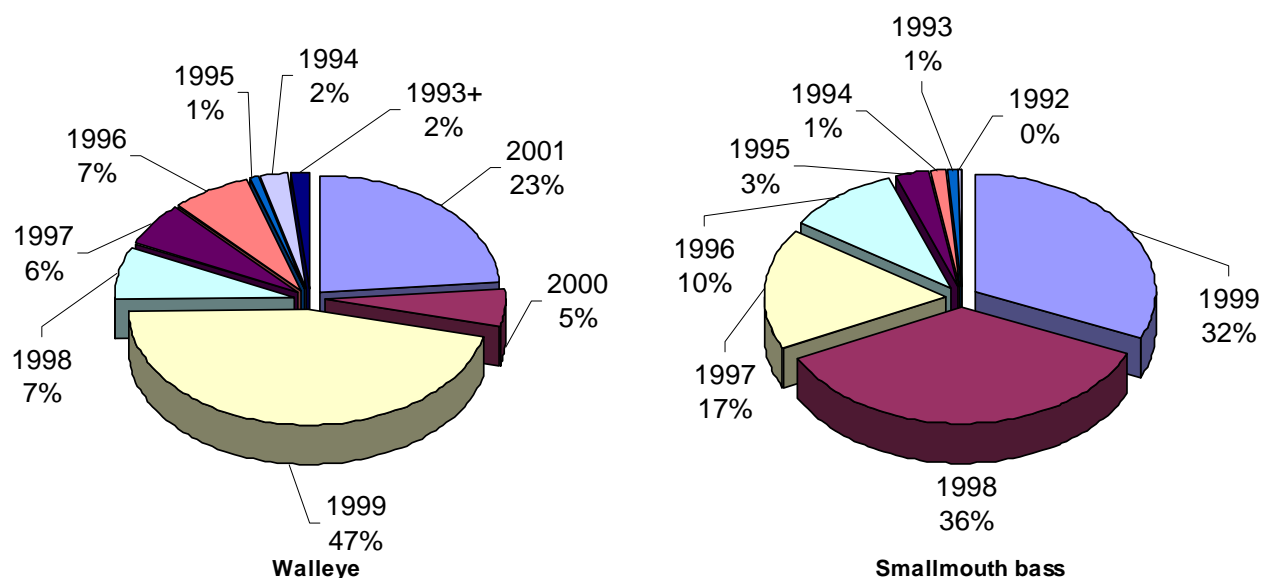


Figure 5. —Year-class contribution to Michigan sport harvest for walleye and smallmouth bass from Lake St. Clair in 2003.

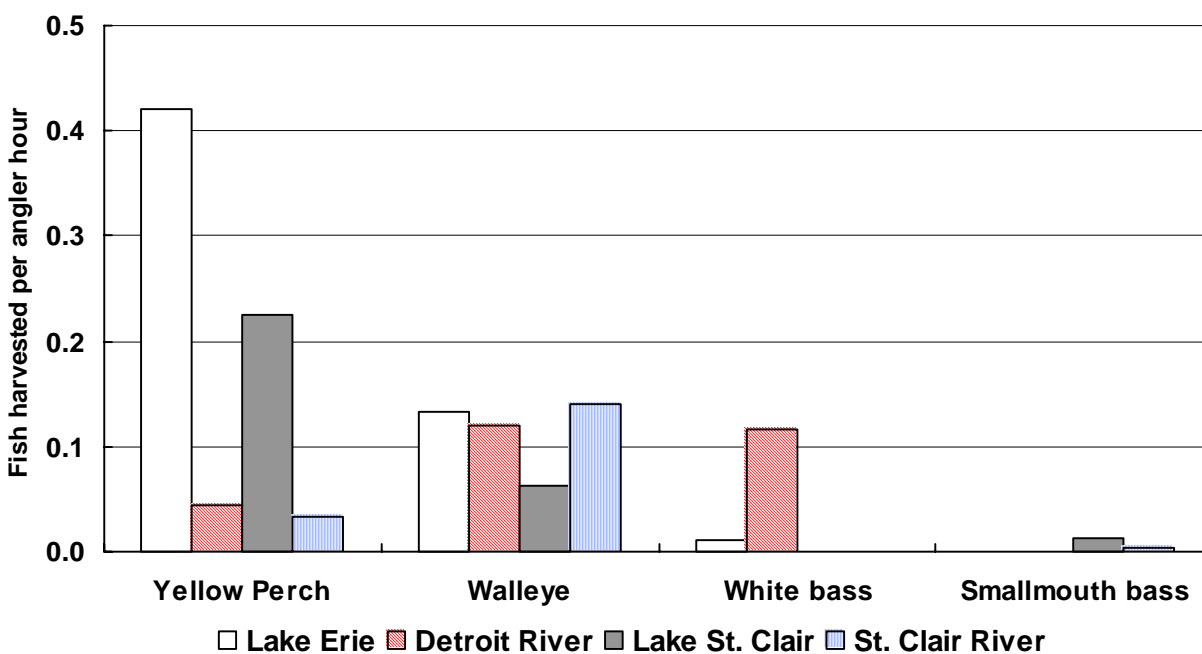


Figure 6.— Harvest rates for yellow perch, walleye, white bass, and smallmouth bass for Southeast Michigan Great Lakes sport fisheries in 2003.

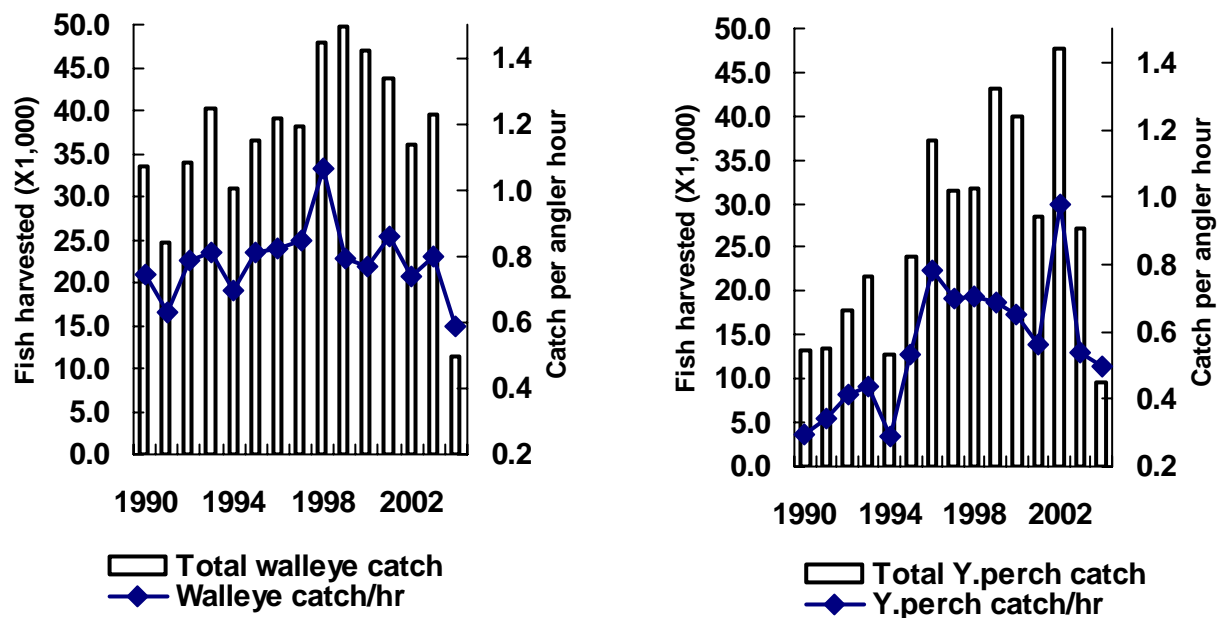


Figure 7. —Michigan charter boat harvest and catch rates for Lake Erie, 1990-2004.

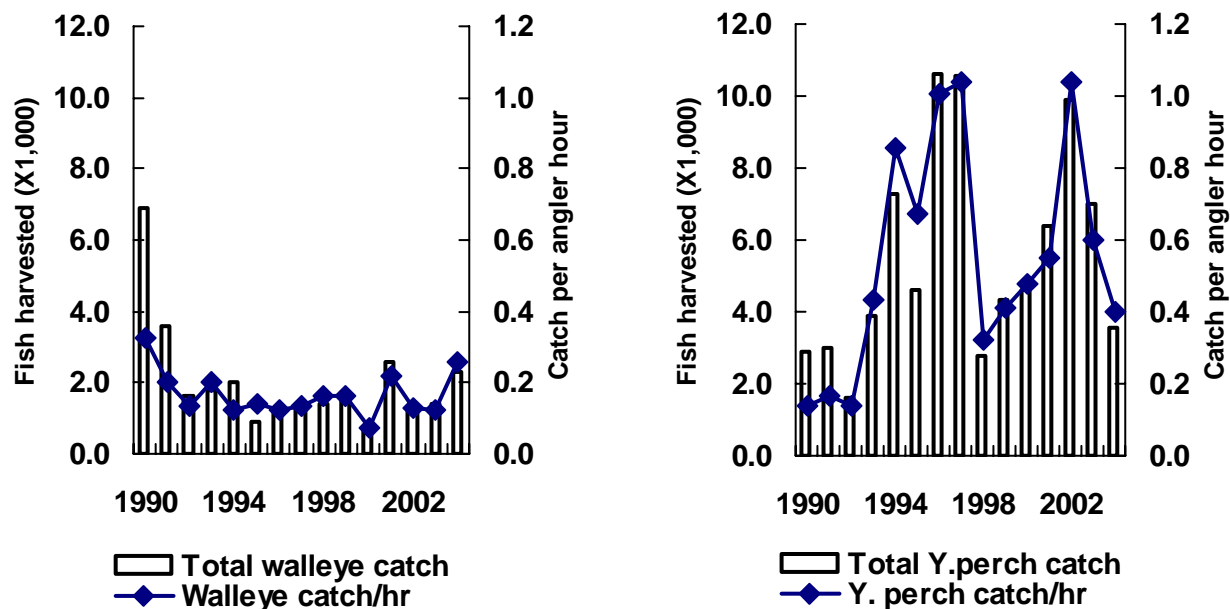


Figure 8. —Michigan charter boat harvest and catch rates for the St. Clair-Detroit River system, 1990-2004.

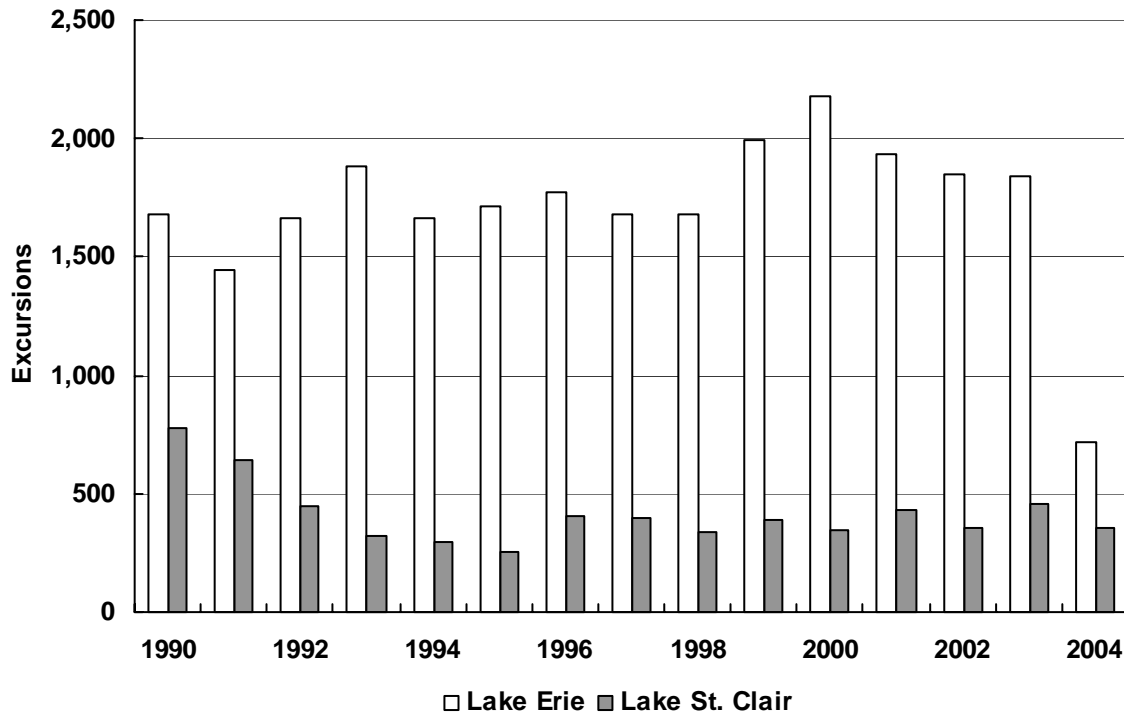


Figure 9. —Reported charter boat excursions on Lake Erie and the St. Clair-Detroit River system, 1990-2004.

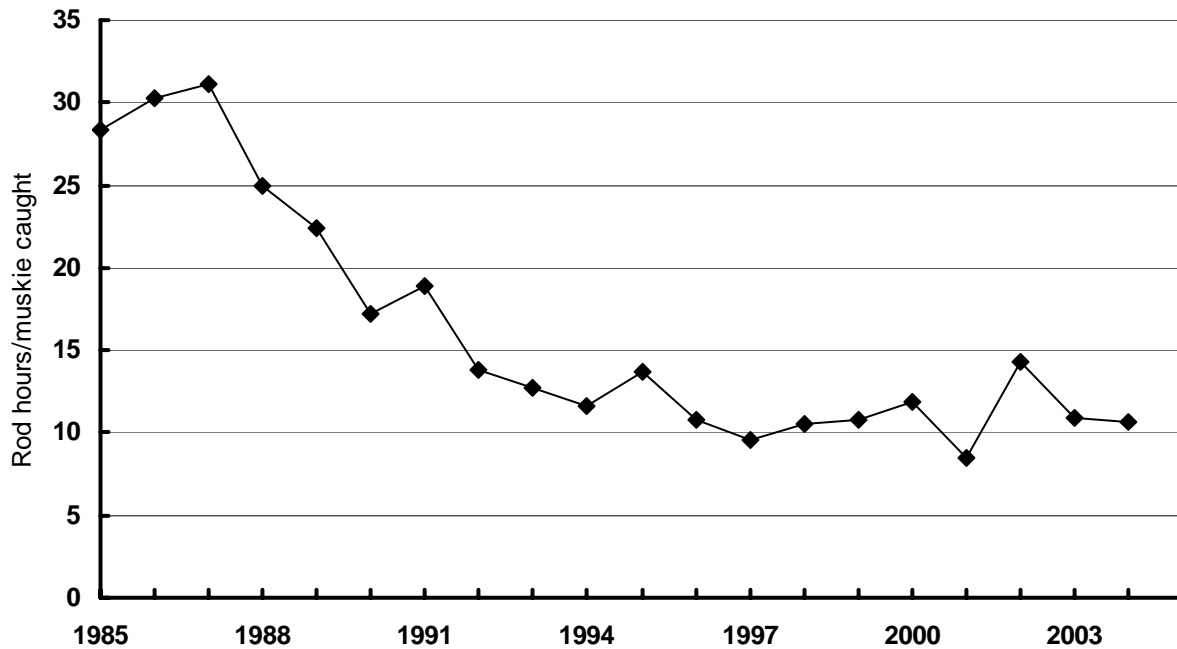


Figure 10. —Lake St. Clair muskellunge catch rate from Angler Diary Program, 1985-2004.

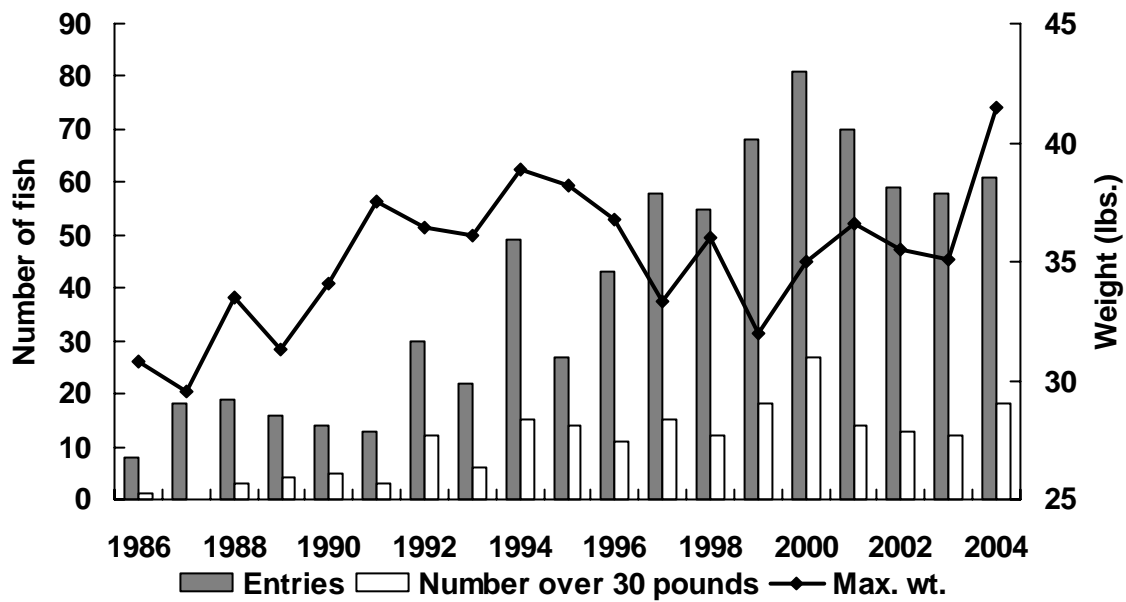


Figure 11. —Lake St. Clair muskellunge entered in the Michigan DNR Master Angler Program, 1986-2004. Values for 1992-2004 represent combined regular and catch-and-release Master Angler categories.

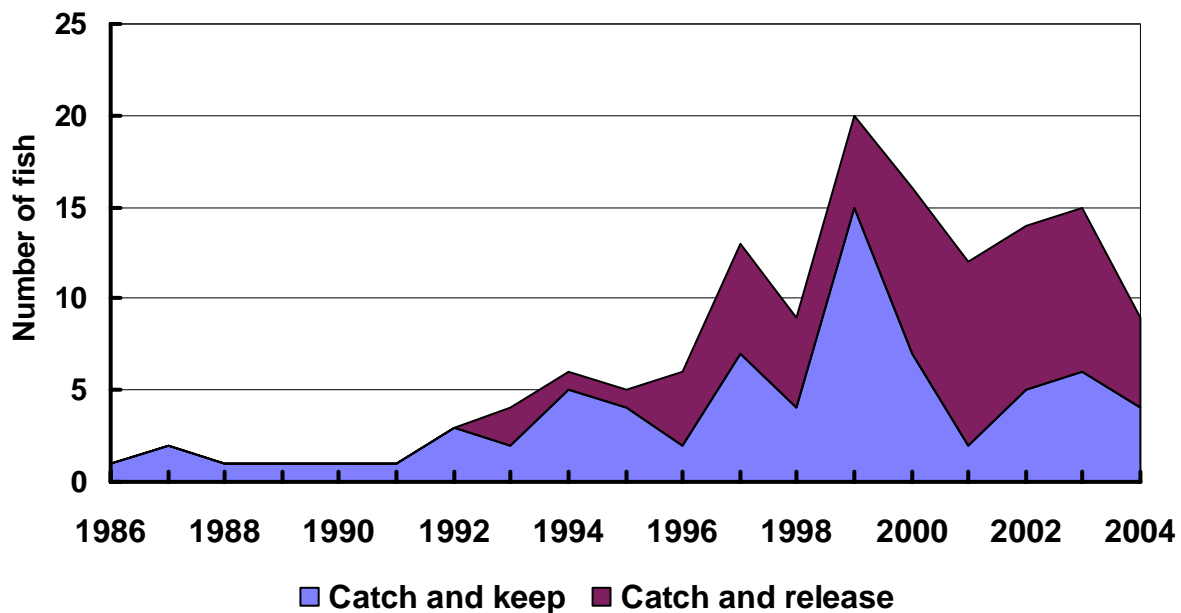


Figure 12. —Lake St. Clair smallmouth bass entered in the Michigan DNR Master Angler Program, 1986-2004.

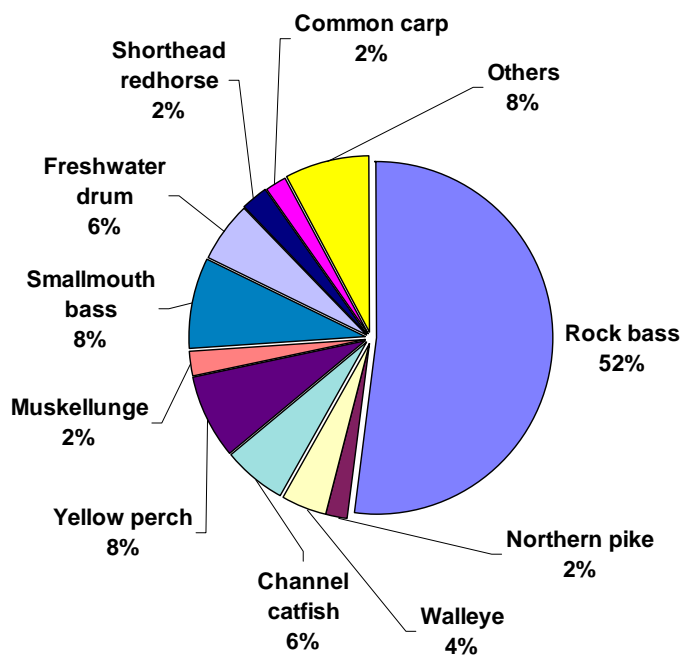


Figure 13. —Catch composition for trap nets fished in Lake St. Clair in May 2004.

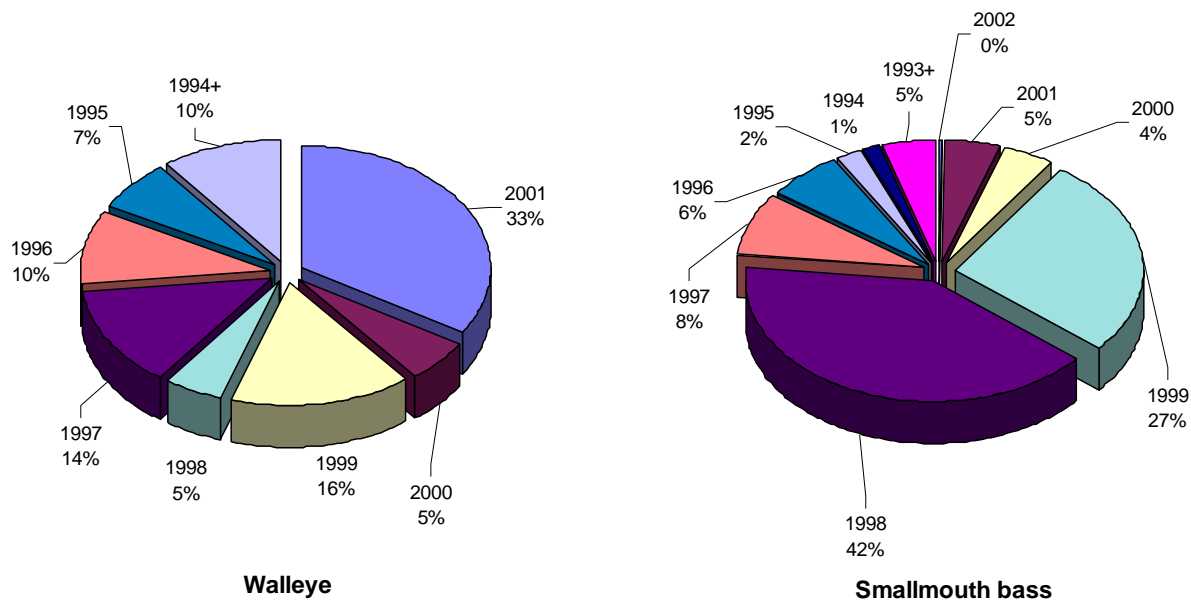


Figure 14. —Year-class contribution for walleye (n=147) and smallmouth bass (n=296) caught in Lake St. Clair trap nets in 2004.

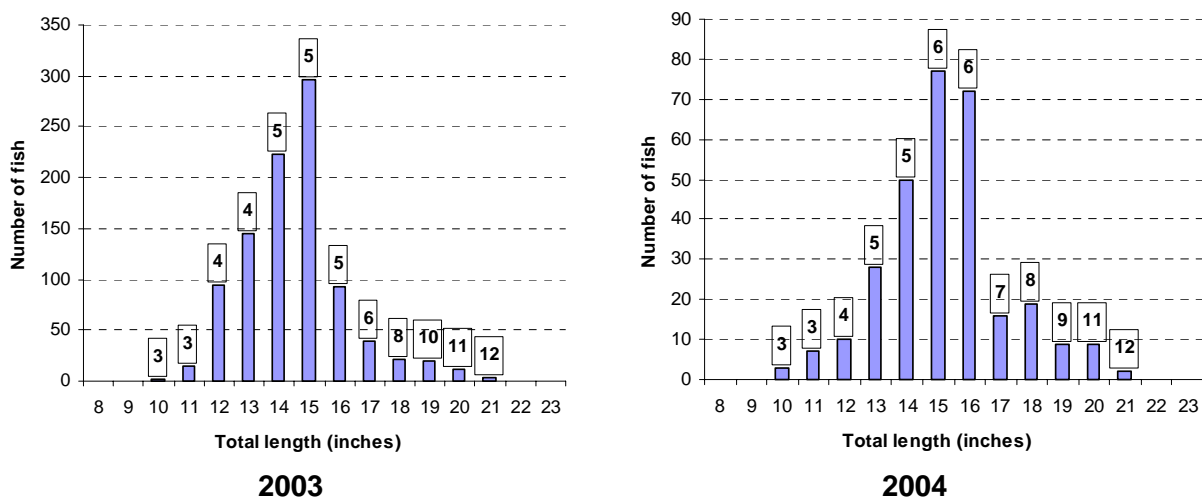


Figure 15. Length frequency of Lake St. Clair smallmouth bass caught in survey trap nets during spring 2003 and 2004. Mean age by inch group is shown in box above corresponding length bar.

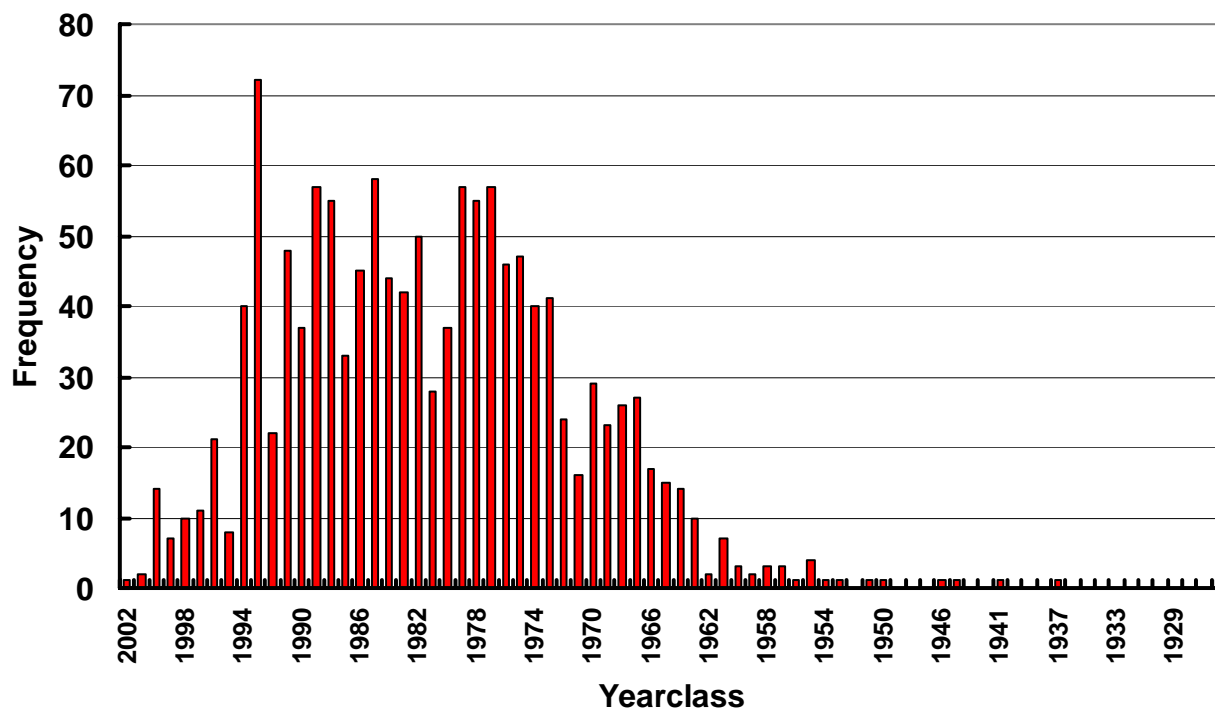


Figure 16. —Year of hatching for lake sturgeon sampled from Lake St. Clair and St. Clair River from 1997 to 2004 by Lake St. Clair Fisheries Research Station (n=1,320).

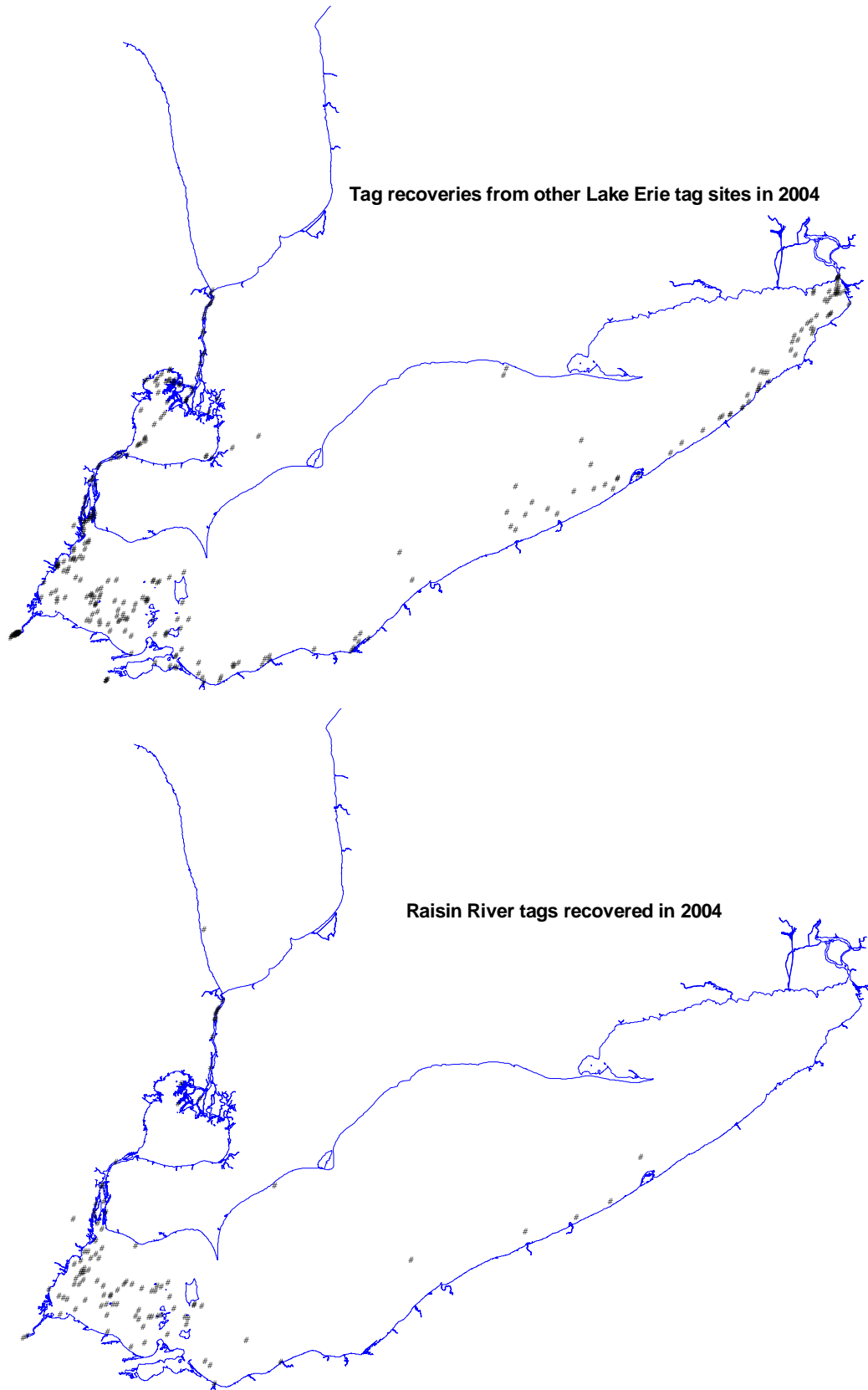
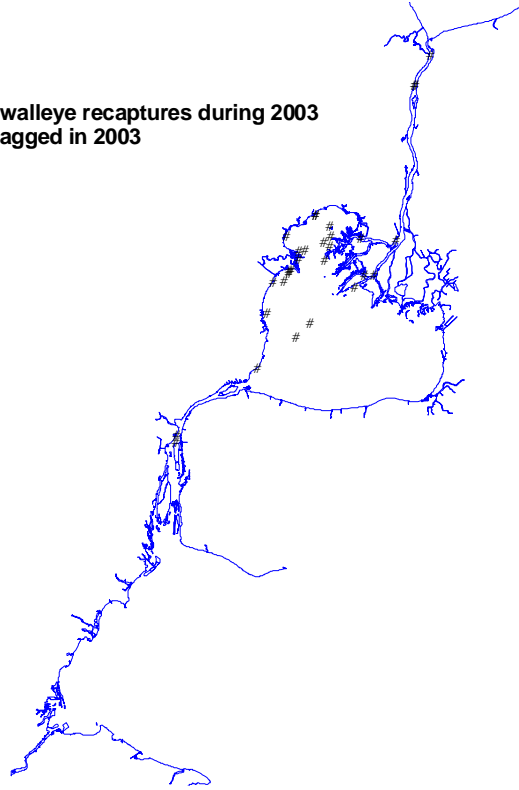


Figure 17.-Geographical distribution of walleye tag recoveries in 2004 from fish tagged during all years at Monroe (135 recoveries in 2004; bottom map) and other Lake Erie tag sites (392 recoveries in 2004; top map).

**Distribution of 21 walleye recaptures during 2003
from 173 fish tagged in 2003**



**Distribution of 15 walleye recaptures during 2004
from 147 fish tagged in 2004**

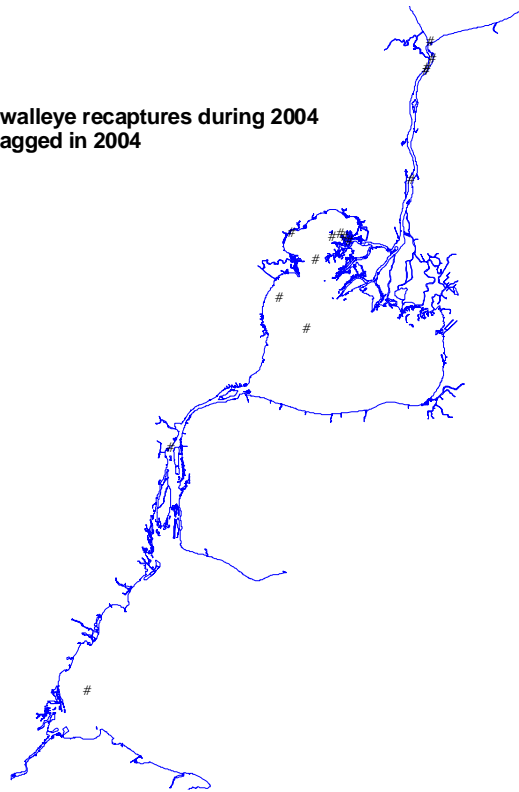


Figure 18.-Geographical distribution of walleye tag recoveries in 2003 and 2004 from fish tagged during each year at the Anchor Bay site in Lake St. Clair.

Table 1. —Estimated sport harvest, catch rate, and effort for Michigan's 2004 Lake Erie non-charter boat fishery. Two standard errors in parentheses.

Species	Harvest per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Yellow perch	0.4212 (0.2652)	10 (134)	8,386 (18,394)	12,334 (20,042)	31,752 (38,009)	156,339 (170,975)	66,176 (42,570)	31,068 (55,220)	306,068 (190,470)
Walleye	0.1323 (0.0394)	0 (0)	126 (378)	39,465 (17,587)	38,469 (17,840)	14,138 (9,533)	3,429 (4,094)	500 (1,165)	96,127 (27,142)
Channel catfish	0.0129 (0.0164)	28 (187)	513 (1,587)	902 (2,464)	4,672 (9,233)	2,691 (6,219)	458 (2,025)	109 (2,024)	9,373 (11,863)
White perch	0.0123 (0.1192)	0 (0)	1,054 (4,013)	274 (872)	1,754 (4,552)	746 (3,062)	4,897 (86,342)	182 (778)	8,907 (86,617)
White bass	0.0109 (0.0129)	15 (151)	1,783 (4,640)	1,784 (3,108)	1,200 (3,480)	343 (866)	2,778 (6,617)	15 (326)	7,918 (9,379)
Freshwater drum	0.0021 (0.0035)	0 (0)	0 (0)	481 (1,668)	705 (1,709)	272 (734)	65 (311)	0 (0)	1,523 (2,518)
Smallmouth bass	0.0003 (0.0008)	0 (0)	0 (0)	0 (0)	156 (537)	36 (183)	20 (102)	26 (184)	238 (605)
Largemouth bass	0.0001 (0.0005)	0 (0)	0 (0)	35 (227)	18 (201)	0 (0)	0 (0)	50 (245)	103 (389)
Bluegill	0.0002 (0.0012)	0 (0)	0 (0)	0 (0)	81 (797)	0 (0)	16 (270)	15 (326)	112 (902)
Rock bass	0.0000 (0.0003)	2 (19)	0 (0)	0 (0)	32 (211)	0 (0)	0 (0)	0 (0)	34 (212)
Northern Pike	0.0000 (0.0003)	0 (0)	0 (0)	0 (0)	0 (0)	36 (184)	0 (0)	0 (0)	36 (184)
Angler hours		1,014 (435)	16,828 (9,977)	172,918 (43,795)	213,024 (38,233)	199,510 (30,245)	90,442 (17,667)	32,917 (10,470)	726,653 (69,398)
Angler trips		223 (107)	4,260 (2,470)	34,426 (8,625)	41,808 (7,720)	37,530 (6,161)	19,335 (3,972)	7,574 (2,562)	145,156 (14,156)
Angler days		223 (107)	4,260 (2,470)	34,293 (8,587)	41,808 (7,720)	37,530 (6,161)	19,335 (3,972)	7,574 (2,562)	145,023 (14,133)

Table 2. —Estimated effort, harvest, and harvest rate for Michigan's 2004 recreational fishery (non-charter boat and ice fishery) on the Detroit River, Lake St. Clair, and the St. Clair River. Estimated catch, including harvest and legal-size fish caught and released is also presented for selected species. Two standard errors in parentheses.

Species	Detroit River			Lake St. Clair			St. Clair River		
	Harvest per hour	Harvest	Catch	Harvest per hour	Harvest	Catch	Harvest per hour	Harvest	Catch
Walleye	0.1201 (0.1096)	55,147 (49,879)	59,569 (54,788)	0.0416 (0.0249)	75,026 (44,600)	81,427 (46,468)	0.1409 (0.1036)	29,410 (21,469)	32,911 (26,371)
Yellow perch	0.0435 (0.1007)	19,973 (46,198)	N/A	0.4438 (0.1127)	800,894 (196,976)	N/A	0.0323 (0.0706)	6,742 (14,732)	N/A
White bass	0.1171 (0.8339)	53,755 (382,889)	68,348 (383,252)	0.0006 (0.0015)	1,134 (2,696)	5,395 (14,089)	0.0000 (0.0000)	0 (0)	353 (4,832)
White perch	0.0040 (0.0395)	1,855 (18,117)	N/A	0.0001 (0.0003)	268 (610)	N/A	0.0000 (0.0000)	0 (0)	N/A
Smallmouth bass	0.0006 (0.0053)	298 (2,444)	14,538 (46,585)	0.0085 (0.0063)	15,288 (11,379)	166,384 (75,730)	0.0038 (0.0194)	795 (4,075)	12,667 (40,777)
Largemouth bass	0.0005 (0.0051)	208 (2,336)	4,689 (23,863)	0.0006 (0.0015)	1,067 (2,662)	27,070 (16,859)	0.0013 (0.0082)	265 (1,705)	801 (6,208)
Northern pike	0.0001 (0.0006)	55 (296)	216 (1,095)	0.0010 (0.0014)	1,799 (2,457)	7,642 (31,895)	0.0008 (0.0048)	169 (1,010)	243 (1075)
Muskie	0.0000 (0.0000)	0 (0)	332 (4,229)	0.0003 (0.0019)	507 (3,432)	1,340 (3,748)	0.0002 (0.0015)	35 (322)	70 (456)
Rock bass	0.0023 (0.0167)	1,074 (7,654)	N/A	0.0024 (0.0024)	4,399 (4,234)	N/A	0.0001 (0.0010)	22 (217)	N/A
Bluegill	0.0002 (0.0014)	74 (659)	N/A	0.0074 (0.0076)	13,375 (13,605)	N/A	0.0030 (0.0224)	627 (4,682)	N/A
Pumpkin-seed	0.0016 (0.0115)	736 (5,289)	N/A	0.0061 (0.0073)	11,002 (13,110)	N/A	0.0000 (0.0000)	0 (0)	N/A
Channel catfish	0.0001 (0.0008)	30 (388)	N/A	0.0003 (0.0007)	563 (1,325)	N/A	0.0000 (0.0000)	0 (0)	N/A
Freshwater drum	0.0003 (0.0030)	140 (1,386)	N/A	0.0016 (0.0030)	2,957 (5,373)	N/A	0.0000 (0.0000)	0 (0)	N/A
Coho salmon	0.0000 (0.0000)	0 (0)	0 (0)	0.0000 (0.0000)	33 (231)	33 (231)	0.0000 (0.0000)	0 (0)	0 (0)
Chinook salmon	0.0000 (0.0000)	0 (0)	0 (0)	0.0000 (0.0000)	113 (433)	148 (522)	0.0006 (0.0024)	118 (500)	126 (520)
Brown trout	0.0000 (0.0000)	0 (0)	0 (0)	0.0000 (0.0000)	0 (0)	22 (156)	0.0001 (0.0013)	22 (278)	22 (278)
Rainbow trout	0.0000 (0.0000)	0 (0)	0 (0)	0.0000 (0.0000)	86 (394)	167 (527)	0.0001 (0.0004)	13 (76)	13 (76)
Angler hours	459,221 (55,388)			1,804,643 (113,578)			208,800 (19,300)		

Table 3. —Total harvest per hour, harvest per excursion, number harvested, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Erie, 2004.

Species	Total harvest per hour	Harvest per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Rainbow trout	0.000	0.000	0	0	0	0	0	0	0	0
Yellow perch	0.498	13.586	0	634	945	1,699	3,807	1,896	774	9,755
Walleye	0.586	15.997	0	27	6,708	4,055	617	79	0	11,486
Other	0.010	0.276	0	0	93	76	0	29	0	198
Angler hours			0	140	9,736	6,413	2,204	808	297	19,598
Angler trips			0	28	1,786	1,170	404	154	61	3,603
Anglers										
Resident			0	26	1,536	984	338	147	39	3,070
Nonresident			0	2	250	186	66	7	22	533
Charter excursions			0	7	351	230	85	31	14	718

Table 4. —Total harvest per hour, harvest per excursion, number harvested, and fishing effort (angler hours, trips, and charter excursions) for charter boats on the St. Clair-Detroit system, 2004.

Species	Total harvest per hour	Harvest per excursion	Month							Season
			Mar & Apr	May	Jun	Jul	Aug	Sep	Oct	
Rainbow trout	0.0001	0.003	1	0	0	0	0	0	0	1
Brown trout	0.0001	0.002	1	0	0	0	0	0	0	1
Chin. salmon	0.0001	0.002	18	0	0	0	0	1	0	19
Yellow perch	0.399	10.000	6	41	702	760	800	532	729	3,570
Walleye	0.256	6.431	904	766	448	106	67	5	0	2,296
Other	0.200	5.022	2	0	583	525	427	253	3	1,793
Angler hours			2,707	1,563	1,802	1,115	915	536	318	8,956
Angler trips			391	215	297	177	148	88	64	1,380
Anglers										
Resident			296	200	280	175	143	88	63	1,245
Nonresident			95	15	17	2	5	0	1	135
Charter excursions			109	59	78	39	33	21	18	357

Table 5. —Commercial harvest from Michigan waters of Lake Erie in 2004.

	Carp	Buffalo	Channel catfish	Gizzard shad	Quillback	Other ¹	Total
Harvest (lbs.)	94,380	18,883	23,600	4,920	3,400	4,173	149,356
% of total	63	13	16	3	2	2	100
Market value	\$15,466	\$11,569	\$13,297	\$738	\$1,530	\$1,493	\$44,093

¹Other category includes bullheads, suckers, and white bass

Table 6. —Walleye CPUE (number per net lift) in multi-filament gill nets during fall surveys on Michigan waters of Lake Erie.

Year Class	Total CPUE	Survey year																	
		1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1976	18.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1977	171.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1978	61.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1979	72.4	0.5	0.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1980	92.7	0.5	0.3	0.0	0.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1981	72.3	2.3	0.5	0.3	0.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1982	306.2	28.5	5.3	7.5	3.5	0.5	—	—	—	—	—	—	—	—	—	—	—	—	—
1983	34.6	5.0	3.5	1.8	1.8	2.0	—	—	—	—	—	—	—	—	—	—	—	—	—
1984	147.7	20.5	3.5	8.0	8.3	2.0	0.5	0.3	0.5	—	—	—	—	—	—	—	—	—	—
1985	177.2	42.5	9.3	14.3	8.5	1.5	1.3	0.8	1.0	—	—	—	—	—	—	—	—	—	—
1986	297.5	96.8	30.3	90.3	43.5	19.5	11.0	3.8	2.0	0.3	—	—	—	—	—	—	—	—	—
1987	127.8	—	4.5	53.8	26.8	20.0	13.8	2.5	3.8	1.0	0.5	0.8	—	0.3	—	—	—	—	—
1988	125.0	—	—	61.5	35.8	9.3	7.3	4.5	4.5	0.5	0.8	0.8	—	—	—	—	—	—	—
1989	52.6	—	—	—	16.0	17.0	10.0	2.8	3.3	1.3	0.8	0.8	0.3	0.3	—	—	—	—	—
1990	136.4	—	—	—	—	54.5	48.0	13.0	16.5	1.5	1.3	1.3	0.0	0.3	—	—	—	—	—
1991	194.3	—	—	—	—	—	63.0	47.3	61.5	11.3	6.8	2.8	1.3	0.3	—	—	—	—	—
1992	17.0	—	—	—	—	—	—	2.0	7.3	2.0	0.3	1.5	2.3	1.0	0.3	—	—	—	0.3
1993	170.0	—	—	—	—	—	—	—	73.3	71.0	11.8	8.08	3.3	1.5	0.3	0.5	—	—	0.3
1994	131.3	—	—	—	—	—	—	—	—	63.3	43.0	14.0	4.8	2.8	1.8	0.8	—	—	0.8
1995	9.1	—	—	—	—	—	—	—	—	—	3.3	1.3	0.8	1.0	0.8	0.8	0.3	—	0.8
1996	179.7	—	—	—	—	—	—	—	—	—	—	37.5	84.3	30.5	13.3	9.8	1.8	1.0	1.5
1997	132.0	—	—	—	—	—	—	—	—	—	—	—	54.3	34.3	20.3	15.3	3.0	1.0	3.8
1998	81.4	—	—	—	—	—	—	—	—	—	—	—	—	26.0	29.5	14.8	6.3	1.0	3.8
1999	170.6	—	—	—	—	—	—	—	—	—	—	—	—	—	57.0	73.3	21.5	5.8	13.0
2000	17.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.5	6.3	0.8	4.0
2001	119.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	42.8	32.5	43.8
2002	4.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.8	4.0
2003	81.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	81.2
Total		196.6	57.5	237.5	144.5	126.3	154.9	77.0	173.7	152.2	68.6	68.8	151.4	98.3	123.3	121.8	82.0	42.8	157.3
Net lifts		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Table 7.— Mean density (number per hectare) for all fish species caught during spring (June) and fall (September or October) with 10 m headrope index trawls in Anchor Bay, Lake St. Clair.

Species	Spring							Fall						
	1998	1999	2000	2001	2002	2003	2004	1998	1999	2000	2001	2002	2003	2004
Alewife	2.5	1.9	3.9	2.9	3.0	0.0	0.0	11.5	1.6	2.8	32.3	0.0	0.0	0.0
Bluntnose minnow	0.2	0.0	11.1	10.0	6.8	0.9	6.0	0.2	9.4	14.8	53.8	32.7	12.5	42.6
Common carp	0.0	0.0	0.2	0.0	0.0	0.0	0.5	0.0	0.1	0.0	1.1	2.1	0.0	0.3
Emerald shiner	0.0	0.0	5.1	0.0	10.6	0.0	1.5	7.5	0.0	0.0	0.0	0.6	0.0	41.2
Freshwater drum	5.0	2.3	0.7	4.5	0.8	3.6	3.0	0.2	1.4	1.0	2.3	0.2	0.6	5.1
Johnny darter	7.0	0.0	0.2	0.3	0.0	0.0	2.5	0.0	0.0	0.10	0.0	0.2	7.2	0.4
Lake sturgeon	0.0	0.1	0.2	0.0	0.8	0.5	0.0	1.4	0.0	0.1	0.0	0.0	0.0	0.0
Largemouth bass	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.0	3.0	1.8	16.4	35.5	13.2	12.6
Logperch	83.3	7.6	0.2	1.6	7.5	0.0	42.3	20.6	1.3	5.2	17.5	5.9	13.6	38.0
Mimic shiner	1.6	0.0	13.5	20.4	362.3	0.0	118.2	0.2	29.8	14.8	9.6	44.1	507.2	8908.9
Muskellunge	0.0	0.1	0.0	0.6	0.8	0.0	0.0	0.0	0.0	0.1	1.1	0.0	0.4	0.0
Northern pike	0.2	0.0	0.1	1.3	0.0	1.4	0.0	0.0	0.1	0.3	0.6	0.6	0.6	0.0
North. shorthead redhorse	0.7	6.9	2.5	3.6	6.8	4.1	2.0	0.2	0.4	0.7	2.3	0.3	0.0	0.2
Pumpkinseed	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	1.6	0.4	5.1	5.4	3.2	0.5
Quillback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.7	0.0	1.7	0.8	1.0
Rainbow smelt	4.3	4.0	3.8	61.1	0.0	14.0	52.8	0.2	0.0	1.0	0.0	0.0	4.0	26.3
Rock bass	5.4	1.0	12.8	29.8	38.5	18.1	5.0	0.9	89.0	92.8	39.6	40.8	34.9	25.4
Round goby	28.1	6.0	10.8	1.3	30.2	5.9	53.3	22.2	9.6	10.0	10.2	99.3	1.8	28.0
Silver lamprey	0.0	0.9	0.3	0.0	0.0	0.5	0.5	0.0	0.2	0.0	0.3	0.0	0.4	0.4
Silver redhorse	0.2	0.4	0.9	0.0	2.3	4.5	2.0	0.7	0.0	0.4	1.1	5.7	0.0	4.1
Smallmouth bass	0.5	0.0	0.8	2.9	3.8	1.8	1.5	24.5	10.7	6.1	0.0	51.4	6.8	3.3
Spottail shiner	8.2	68.9	935.4	7.4	5729.6	210.6	1777.1	45.3	200.0	50.5	878.5	2406.5	1068.0	544.6
Trout-perch	98.5	154.0	34.3	11.0	264.9	13.1	107.7	25.8	2.9	0.2	0.0	9.7	5.7	58.5
Walleye	0.9	1.7	1.2	0.6	0.8	0.9	0.0	2.7	0.9	0.8	0.0	11.3	0.0	2.2
White perch	0.0	0.4	13.3	0.6	0.8	0.5	2.0	7.5	0.1	0.1	0.0	13.2	8.4	6.2
White sucker	3.6	0.0	2.5	1.3	61.1	2.3	67.9	0.0	0.3	1.0	0.6	8.0	0.7	1.2
Yellow perch	249.7	866.9	157.8	1131.7	724.5	306.1	887.5	68.8	21.7	40.9	113.8	73.3	181.2	47.8

Table 8.—Catch rate by age for yellow perch in June index trawl tows on Lake St. Clair.

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